

Technology Opportunity

Technology Transfer & Partnership Office

TOP3-00220

Small Multi-Purpose Research Facility

Facility

The Small Multi-Purpose Research Facility (SMiRF) is a low-cost, small-scale screening facility simulating space and launch environments for propulsion concept and component testing with liquid hydrogen. The facility can also handle GH_2 and GO_2 . Up to 512 channels of data can be collected at a nominal rate of 1 MHz. Up to 15 additional high speed channels with a collection rate of 2 MHz are available. Data is collected and processed by a dedicated workstation computer and is archived on Glenn's central computer.

- Offers tailored test conditions for concept screenings and component testing
- Offers cryogenic fluid handling
- Provides simulated shuttle ascent pressure profile
- Accommodates in-house and private industry research programs
- Experienced staff of technicians, operations engineers, and research scientists

Facility Benefits

- Calibrated and documented test section conditions
- Real-time data acquisition and display in both alphanumeric and graphical format

Commercial Applications

- Cryogenic storage
- Insulation and transfer technologies for cryogenic fluids
- Mass gauging



SMiRF complex.

Programs and Projects Supported

- Insulation performance tests for the X-33 vehicle
- Rapid chill and fill of a subscale propellant tank for the High Energy Upper Stage program
- Demonstration of a zero boiloff long-term cryogenic storage concept for the Mars Exploration Program

Capabilities

SMIRF	
Dimensions (diam. by length)	72 by 100 in.
Vacuum system	(Three) 10-in. ODP
No load pressure (torr)	8.5×10^{-6}
Pumping speed liter/sec (air)	7,000
Features	<ul style="list-style-type: none">• Hazardous test capability• Thermal shroud• Launch pressure profile

Facility Testing Information

<http://facilities.grc.nasa.gov>

Contacts

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Cryocooler preparation for zero-boiloff test.